Third Year B. Tech., Sem VI 2021-22

Software Engineering Tools Lab

Assignment Submission

Assignment No-2

Topic :Google Colab

Batch :T2

Students
2019BTECS00043
2019BTECS00083
2019BTECS00079

1. Original author

   Ans : Google collab is product of Google Research

2. Developers

   Ans : Google developers team developed google collab

3. Initial release:

   Ans: 2014

4. Stable release

   Ans: 2017

5. Preview release

   Ans: 2014

6. Repository (with cloud support)

   Ans: https://github.com/googlecolab

7. Written in (Languages)

   Ans : Python

8. Operating System support

   Ans: Windows, Linux distributions, MAC

9. Platform ,portability

   Ans: Web, yes it is portable

10. Available in (Total languages)

    Ans: 40 languages including python,R,scala,julia etc…

11. List of languages supported

    Ans: python,R,scala,julia and even more

12. Type (Programming tool, integrated development environment etc.)

    Ans: It is Notebook environment for collaborative development

13. Website

    Ans: https://colab.research.google.com/

14. Features

    Ans: Interactive tutorials to learn machine learning and neural networks

    Execute terminal commands from notebook

    Import datasets from external sources

    Free cloud services, GPUs and TPUs

15. Size (in MB, GB etc.)

    Ans: 12.7 GB

16. Privacy and Security

    Ans: It is secure as it is our private google document and no one can access it

17. Type of software (Open source/Licence)

Ans: Open source

18. If Licence- Provide details.

    Ans:

19. Latest version

    Ans:

20. Cloud support (Yes/No)

    Ans: yes

21. Applicability

    Ans: To develop collaborative softwares or programs

22. Drawbacks (if any)

    Ans:

Question 2 -

Downloading Given Data Set -

```
[4]  %%shell
     mkdir -p /tmp/lifetime-value/kdd_cup_98
     wget https://archive.ics.uci.edu/ml/machine-learning-databases/kddcup98-mld/epsilon_mirror/cup98lrn.zip -P /tmp/lifetime-value/kdd_cup_98/
     wget https://archive.ics.uci.edu/ml/machine-learning-databases/kddcup98-mld/epsilon_mirror/cup98val.zip -P /tmp/lifetime-value/kdd_cup_98/
     wget https://archive.ics.uci.edu/ml/machine-learning-databases/kddcup98-mld/epsilon_mirror/valtargt.txt -P /tmp/lifetime-value/kdd_cup_98/
     cd /tmp/lifetime-value/kdd_cup_98/
     unzip cup98lrn.zip
     unzip cup98val.zip
```

Output of Regression (Donations And Count)

```
plot_hist_log_scale(y[y>0])
```

No handles with labels found to put in legend.
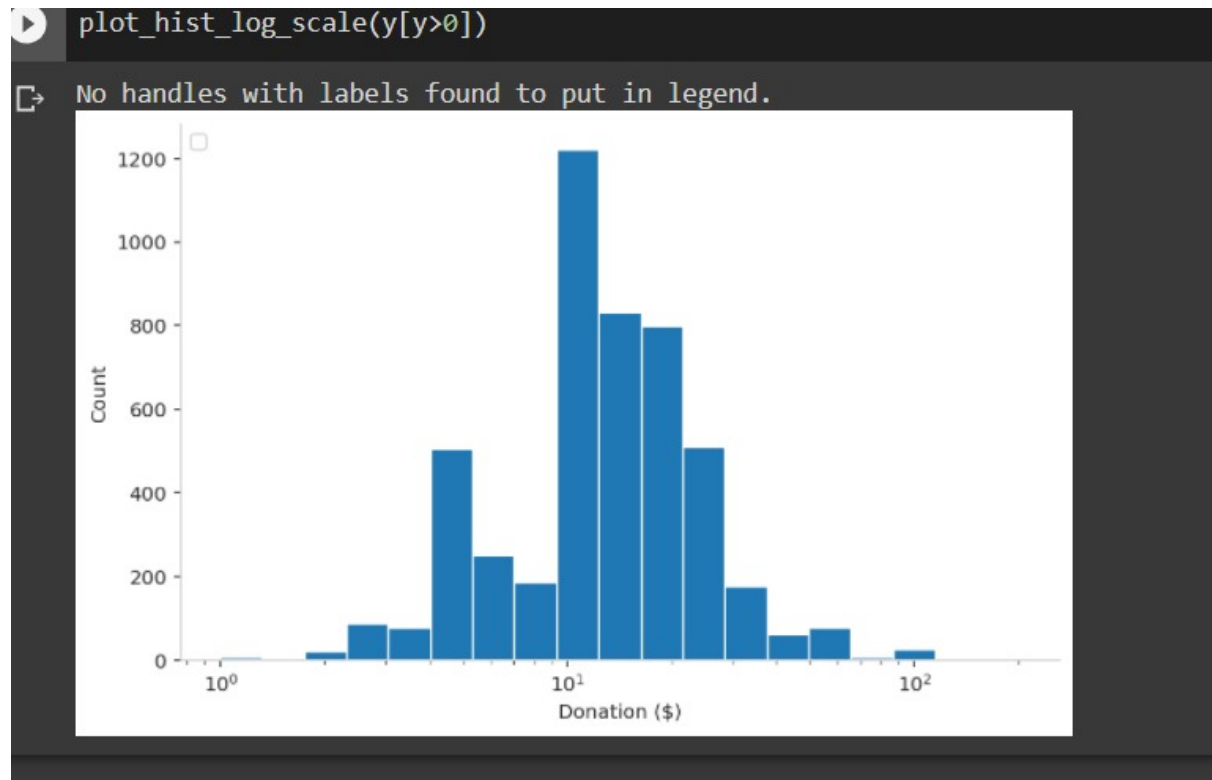
Training Data -

```
[25] callbacks = [
         tf.keras.callbacks.ReduceLROnPlateau(monitor='val_loss', min_lr=1e-6),
         tf.keras.callbacks.EarlyStopping(monitor='val_loss', patience=10),
     ]
```

```
[26] history = model.fit(
         x=x_train,
         y=y_train,
         batch_size=2048,
         epochs=200,
         verbose=2,
         callbacks=callbacks,
         validation_data=(x_eval, y_eval)).history

     Epoch 1/200
     47/47 - 8s - loss: 0.4851 - val_loss: 0.3560 - lr: 0.0010 - 8s/epoch - 166ms/step
     Epoch 2/200
     47/47 - 2s - loss: 0.3574 - val_loss: 0.3546 - lr: 0.0010 - 2s/epoch - 33ms/step
```

Total Profit -

Total Profit

```python
unit_costs = [0.4, 0.5, 0.6, 0.68, 0.7, 0.8, 0.9, 1.0]
```

```python
[30]  num_mailed = [np.sum(y_pred > v) for v in unit_costs]
      num_mailed
```

```
[90096, 80404, 67015, 55471, 52694, 39260, 27743, 18761]
```

```python
[31]  baseline_total_profit = np.sum(y_eval - 0.68)
      baseline_total_profit
```

```
10560.074
```

```python
[32]  total_profits = [np.sum(y_eval[y_pred > v] - v) for v in unit_costs]
      total_profits
```

```
[37133.24,
 28405.14,
 20239.139,
 15020.856,
 14103.342,
 9779.139,
 6935.0723,
 5350.95]
```

Loss Graph -

```python
pd.DataFrame(history)[['loss', 'val_loss']].plot();
```